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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,057	03/30/2004	Vladislav Sklyarevich	4403	5736

7590

07/14/2006

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EXAMINER

SELLMAN, CACHET I

ART UNIT

PAPER NUMBER

1762

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/814,057

Applicant(s)

SKLYAREVICH ET AL.

Examiner

Cachet I. Sellman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                                                |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                           | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/30/2004</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 10 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In claim 10 the applicant requires that the thickness of the ceramic is "approximately equal to the skin layer for the selected microwave beam frequency", it is unclear to the examiner what is meant by "skin layer for the selected microwave beam frequency" and the applicant does supply a clear definition of "skin layer for the selected microwave beam frequency" in the specification therefore the specification does not enable one of ordinary skill in the art to use the invention. Without a clear definition of the limitation it is not possible to search the limitation.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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5. Claim 10 recites the limitation "skin layer" in line 2. There is insufficient antecedent basis for this limitation in the claim. In claim 10 the applicant claims that the thickness of the ceramic is approximately equal to the "skin layer" for the microwave beam frequency. However, in claim 1 from which claim 10 depends there is no mention of a skin layer.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1,2, 4, 9, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Admitted State of the Prior Art (APA) in view of Guimont (US 2003/0224115 A1).

The APA teaches a process for heat treating coatings by positioning a ceramic adjacent to the coating to be treated where the ceramic is irradiated by the microwave which results in the ceramic being heated to a temperature to heat the coating and adhere it to the metal substrate [0009 and Figure 1]. The APA also states that the heat treating can be used where the coating is a polymer and the substrate is a metal such as a blade [Figure 2 and 0024].

The APA does not teach that the metal surface is heated without temperature degradation of the metal as required by **claim 1**.

Guimont discloses a process for applying a coating containing a fusible material to a cutting edge which is made of metal and heating the fusible material with microwave energy (abstract). Guimont teaches that the heating temperature, duration of heating must be adjusted to avoid any significant decomposition of the polymer or negative impact on the blade [0020].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of the APA to include adjusting the temperature to ensure there is no degradation of the metal as taught by Guimont. One would have been motivated to do so because both the APA and Guimont disclose processes for applying a polymer coating to a metal substrate (blade edge) using microwave energy and Guimont further teaches that the temperature must be adjusted to ensure that there is not a negative impact on the blade therefore one would have a reasonable expectation of success in applying the coating to the metal without damaging the metal substrate.

The APA does not teach using a gyrotron beam as required by **claim 2**.

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However, Guimont discloses that in the process of coating a metal blade with a polymer and heating using microwave energy that several known and conventional microwave generators can be used such as a gyrotron [0018].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of the APA to include the gyrotron beam of Guimont. One would have been motivated to do so because the APA is silent on the type of microwave beam that is used in the process of heating a polymer coating on a metal blade and Guimont teaches that the gyrotron is a suitable microwave generator for the process therefore one would have a reasonable expectation of success in heating the polymer coating on the metal substrate using the gyrotron beam.

In claim 11, the applicant requires that the thickness of the ceramic be “preferably selected to be in the range of 1-5mm.” However the use of the term preferably means the thickness in the claims is not required.

The APA does not teach using a microwave beam frequency between 10 – 200 GHz as required by **claim 4**. However, Guimont teaches that the settings of the microwave beam should be adjusted to avoid any significant decomposition of the polymer or negative impact on the blade (metal) [0020]. Therefore the frequency is a result effective variable and it would have been obvious to one having ordinary skill in the art to use the frequencies within the claimed range through routine experimentation in order to heat treat the polymer material without decomposition of the polymer or any negative impact on the metal especially absent any criticality in using the claimed range.

Therefore the ceramic of the APA has a thickness therefore it meets **claim 11**.

The APA does not teach exposing the top surface of the bottom surface of the ceramic to the microwave beam as required by **claims 9 and 12**.

The APA and Guimont does not limit which surface of the ceramic is exposed to the microwave beam therefore it would have been obvious to one having ordinary skill in the art to expose either the top or bottom surface of the ceramic through routine experimentation in order to ensure that ceramic is uniformly heated and performs the intended function of heating the polymer coating on the metal surface without degradation of the metal especially absent any criticality in exposing either the top or bottom surface of the ceramic.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the APA in view of Guimont as applied to claim 1 above and in further view of Apte et al. (US 5072087) and Trankiem et al. (US 547776).

The teachings of the APA in view of Guimont as applied to claim 1 are as stated above.

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The APA in view of Guimont does not teach that the ceramic selected from a group consisting of an oxide ceramic material in a solid state or a powder based on silicon dioxide, and oxides of aluminum, zirconium, or magnesium having a melting point higher than 2000C as required by **claim 3**.

Apte et al. discloses a process for heat treating materials that do not couple well with microwave energy using microwave energy which involves the use of a microwave susceptor (a material that is compatible with microwaves) which generates heat in the material being heat treated (abstract). The susceptor material can be alumina (aluminum oxide).

Trankiem et al. teaches a process for applying a polymer coating to a razor blade cutting edge where the coating is melted onto the blade by using a microwave source. Trankiem et al. further teaches that the use of microwave with metallic materials tend to result in arcing which can be detrimental to the razor blade cutting edge. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the ceramic out of alumina as taught by Apte et al. One would have been motivated to do so because Apte et al. teaches the use of alumina to heat substrates that are not compatible with microwave beams and Trankiem et al. teaches that applying microwave energy to metallic materials can result in arcing which can be detrimental to the metal and the APA is silent on the type of ceramic that is used in the process therefore one would have a reasonable expectation of success in using



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an alumina ceramic to heat the polymer coating in order to ensure that the metal blade would not be affected.

9. Claims 5-8 and 9 and 12 are rejected under 35 U.S.C. 103(a) as being obvious over The APA in view of Guimont as applied to claim 1 above and in further view of Sklyarevich (US 6424090 B1).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

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The teachings of the APA in view of Guimont as applied to claim 1 are as stated above.

The APA in view of Guimont does not teach delivering the microwave beam in a quasi optical manner, by a metal mirror, obtaining the necessary configuration and uniformity of power within the microwave beam by using the metal mirror or obtaining the necessary temperature distribution within the ceramic by scanning the microwave beam using the mirror as required by **claims 5-8** respectively.

Sklyarevich teaches a system for increasing the power density distribution uniformity of a gyrotron radiation beam by providing a mirror for reflecting the beam onto an object to be irradiated (abstract). The mirror can be used to scan the beam over the object that is to be irradiated (column 3, lines 44-50, column 2, lines 42-44).


It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of APA in view of Guimont to include the use of a mirror to deliver the microwave beam to the ceramic as taught by Sklyarevich. One would have been motivated to do so because Guimont teaches the importance of having uniform heating and distribution and Sklyarevich teaches that the uniformity can be achieved by using mirrors with a gyrotron beam therefore one would have a reasonable expectation of success in supplying uniform temperature and power distribution by using mirrors.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cachet I. Sellman whose telephone number is 571-272-0691. The examiner can normally be reached on Monday through Friday, 7:00 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Cachet I Sellman  
Examiner  
Art Unit 1762

  
**TIMOTHY MEEKS**  
**SUPERVISORY PATENT EXAMINER**